RAM GROUP *The Risk Assessment & Management Group of Gannett Fleming, Inc.*

DRAFT
Transmitted by E-Mail

To: Joe Haake

From: Atul M. Salhotra, Ph.D.
Sungmi Moon, Ph.D.
Kendall L. Pickett

Date: November 1, 2010

RE: Risk Evaluation for Outdoor Inhalation of Vapors from Groundwater by Construction Worker in Sub-areas 2C, 3H, and 6B
Boeing Tract 1 Facility, St. Louis, Missouri

This memo presents the updated non-carcinogenic risks to construction worker in Sub-areas 2C, 3H, and 6B at the Boeing Tract 1 Facility in St. Louis, Missouri. This update is necessary because in the *Final Risk Assessment* (Tetra Tech, March 2008) the representative groundwater concentrations were not capped at the constituent solubility levels. Also refer to the memo titled *Risk Evaluation of TPH for Indoor Inhalation Pathway* (RAM Group, January 12, 2010).

Table 1 compares the groundwater exposure point concentrations (EPCs) with the solubility values. The table also presents the updated hazard quotients (HQs) for EPCs capped at solubility levels.

The results indicate that the HQs for several carbon fractions exceed unity (1.0).

Upon approval by MDNR, this memo will be included in the Corrective Measures Study to ensure the administrative record is complete.

If you have any questions, please let us know.

References

Tetra Tech, March 2008. Final Risk Assessment, Boeing Tract 1 Facility, St. Louis, Missouri.

RAM Group, January 12, 2010. Risk Evaluation of TPH for Indoor Inhalation Pathway, Boeing Tract 1 Facility, St. Louis, Missouri.

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Table 1
Updated Hazard Quotient for Outdoor Inhalation of TPH Vapors from Groundwater by Construction Worker (2008 Risk Assessment by TetraTech) in Sub-areas 2C, 3H, and 6B
Boeing Tract 1, St. Louis, Missouri

TPH Groups and Carbon Fractions	Solubility (mg/L)	Sub-area 2C				Sub-area 3H				Sub-area 6B			
		GW EPC (mg/L)	Ratio of GW EPC / Solubility	HQ	Updated HQ	GW EPC (mg/L)	Ratio of GW EPC / Solubility	HQ	Updated HQ	GW EPC (mg/L)	Ratio of GW EPC / Solubility	HQ	Updated HQ
TPH-GRO Aliphatics >nC5 to nC8	11	89	8.1	660	81.6	--	--	--	--	2.03	0.2	15	15
TPH-GRO Aliphatics >nC9 to nC18	0.01	89	8900	160	0.018	--	--	--	--	2.03	203	3.7	0.018
TPH-GRO Aromatics >nC9 to nC18	51	89	1.7	230	132	--	--	--	--	2.03	0.04	5.3	5.3
TPH-DRO Aliphatics >nC9 to nC18	0.01	0.305	31	0.56	0.018	1.77	177	3.2	0.018	99.6	9,960	180	0.018
TPH-DRO Aromatics >nC9 to nC18	5.8	0.305	0.053	0.66	0.66	1.77	0.305	3.8	3.8	99.6	17	220	12.8

Notes:
mg/L: Milligrams per liter
Ratio > 1: EPC higher than solubility and has to be set equal to solubility
EPC: Exposure point concentration
GW: Groundwater
TPH: Total petroleum hydrocarbon
HQ: Hazard quotient for outdoor inhalation of vapors from groundwater by construction worker

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